Yaglom, A. M.

Pinsker, M. S., and Yaglom, A. M. On linear extrapolation of random processes with stationary *n*th increments. Doklady Akad. Nauk SSSR (N.S.) 94, 385-388 (1954). (Russian) 62

The authors extend the usual criteria and classifications of linear least squares extrapolation (prediction) theory, continuous parameter case, from stationary (wide sense) stochastic processes to stochastic processes having stationary (wide sense) *n*th order increments. These processes were defined and discussed in a previous paper [same Doklady (N.S.) 90, 731-734 (1953); these Rev. 15, 238]. Proofs are omitted. *J. L. Doob* (Urbana, Ill.).

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YAGLOM, A. M.

USSR/Mathematics

Card 1/1 : Pub. 22 - 5/41

Authors : Yaglom, A. M.

Title : Effective solutions of linearly approximating problems of processes with incidental stationary n-th increments.

Periodical : Dok. AN SSSR 98/2, 189-192, Sep 11, 1954

Abstract : Methods of effective solutions of problems dealing with processes with incidental stationary n-th increments are described. Five cases of varying difficulty and various spectral densities (of matrices) are considered. Five theorems are presented and each of them gives a formula which might be applied to a solution. Ten references (1949-1954).

Institution : Geophysical Institute of the Acad. of Scs. of the USSR

Presented by : Academic. A. N. Kolmogorov, June 12, 1954

YAGLOM, A.M.

Yaglom, A. M. Extrapolation, interpolation and filtering of stationary random processes with rational spectral density. Trudy Moskov. Mat. Obšč. 4 (1955), 333-374. (Russian) 1. - F/W

The author gives a very detailed discussion of his stated subject distinguished by clear formulation and rigorous and explicit solution. The results were extended to processes with stationary nth order increments in the paper reviewed below. The solutions were discussed in an earlier paper [see the preceding review]. *J. L. Doob*

YAGLOM, AKIVA MOISEYEVICH

YAGLOM, Akiva Moiseyevich

YAGLOM, Akiva Moiseyevich - Academic degree of Doctor of Physicomathematical Sciences, based on his defense, 26 October 1955, in the Council of the Geophysical Inst Acad Sci USSR, of his dissertation entitled: "Theory of the correlation of uninterrupted processes and fields with application to the problem of statistical extrapolation of temporary series and to the theory of turbulence." For the Academic Degree of Doctor of Sciences

SO: Byulleten' Ministerstva Vyshego Obrazovaniya SSSR, List No. 2, 21 January 1956, Decisions of the Higher Certification Commission concerning academic degrees and titles.

YAGLOM, A. M.

"Extrapolation and Filtration of Time Series," a paper presented at the Soviet Conference on Communication Theory, 6-7 Dec 55, Priroda, March 1956.

Sum 916, 3 Mayb56

DOOB, Joseph Leo, 1910-,; DOBRUSHIN, R.L.,[translator]; YAGLOM , A.M., [translator], red.

[Stochastic processes] Veroiatnostnye protsessy. Perevod s angliiskogo. Moskva, Izd-vo inostrannoi lit-ry, 1956. 605 p. (MIRA 11:10)

(Probabilities)

Yaglom, A.M.

USSR/Theoretical Physics - General Problems

B-1

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33707

Author : Gel'fand, I. M., Yaglom, A. M.

Institution : None

Title : Methods of the Theory of Random Processes in Quantum Physics

Original Periodical : Vestn. Leningr. Un-ta, 1956, No 1, 33-34

Abstract : Brief Discussion of the possible utilization of methods of the theory of integration in functional spaces in problems of quantum mechanics.

Card 1/1

1-PW

in terms of the variance. The terms in the series agree with those gotten earlier by other methods (e.g. E. P. Wigner, Phys. Rev. (2) 40 (1932), 749-759)

YAGLOM, A.M.

Gel'fand, I. M. and Yaglom, A. M. Integration in function spaces and its application to quantum physics. [illegible] 114.

[illegible]

This is a clear expository account of the development of Wiener's mathematical theory of Brownian motion contributed to by Kac, Cameron and Martin, etc., on the one hand, and the work of Feynman and other physicists formulating quantum field theory in terms of integration on function spaces. Emphasis is on the role of the mathematical work in quantum theory, rather than in itself or in relation to stochastic processes. There is a fairly extensive bibliography.

Phys

Section 1 develops the theory of Wiener measure in the space of continuous functions, which is related to the heat equation. Attention is given the evaluation of special integrals along the lines represented by the work of Kac [Trans. Amer. Math. Soc. 65 (1949), 1–13; MR 10, 383]. Section 2 relates functional integration to the problems of quantum mechanics, and especially to the Schrödinger equation. The origin of the approach is apparently the (unpublished) Ph.D. thesis of Feynman, whose well-known papers provide the main physical basis for the present exposition. Section 3 treats transformation of [illegible]

Translation soon to be published in "Fortschritte der Physik"

YAGLOM, A.M.

USSR/MATHEMATICS/Theory of probability CARD 1/2 PG - 995

SUBJECT USSR/MATHEMATICS/Theory of probability
AUTHOR GELFAND I.M., KOLMOGOROV A.N., YAGLOM A.M.
TITLE On a general definition of an amount of information.
PERIODICAL Doklady Akad.Nauk 111, 745-748 (1956)
reviewed 7/1957

Let $\mathfrak{T}$ be a Boolean algebra and let P denote a probability on $\mathfrak{T}$. If $\mathfrak{A}$ and $\mathfrak{L}$ are two finite subalgebras of $\mathfrak{T}$, then the expression

$$I(\mathfrak{A},\mathfrak{L}) = \sum_{i,j} P(A_iB_j) \log \frac{P(A_iB_j)}{P(A_i)P(B_j)}$$

is by definition "the amount of information contained in the results of the experiment $\mathfrak{A}$ relative to the results of the experiment $\mathfrak{L}$" ($I(\mathfrak{A},\mathfrak{L}) = I(\mathfrak{L},\mathfrak{A})$). Generally,

(1) $$I(\mathfrak{A},\mathfrak{L}) = \sup_{\mathfrak{A}_1 \subseteq \mathfrak{A},\ \mathfrak{L}_1 \subseteq \mathfrak{L}} I(\mathfrak{A}_1,\mathfrak{L}_1),$$

where $\mathfrak{A}_1$ and $\mathfrak{L}_1$ are finite subalgebras; symbolically (1) can be written

Doklady Akad.Nauk 111, 745-748 (1956) CARD 2/2 PG - 995

$$I(\mathfrak{A},\mathfrak{L}) = \iint_{\mathfrak{A}\,\mathfrak{L}} P(d\mathfrak{A}\,d\mathfrak{L}) \log \frac{P(d\mathfrak{A}\,d\mathfrak{L})}{P(d\mathfrak{A})P(d\mathfrak{L})} .$$

Suppose now that $\mathfrak{T}$ is a Boolean σ-algebra, P a σ-additive probability on $\mathfrak{T}$ and (X,S_X) (S_X a σ-algebra) a measurable space. A random element of the space X is a homomorphism $\xi^*(A) = B$ of S_X into $\mathfrak{T}$. The expression

$$I(\xi,\eta) = I(\mathfrak{T}_\xi, \mathfrak{T}_\eta)$$

is taken as definition of the amount of information, $\mathfrak{T}_\xi = \xi^*(S_X)$.

A condition under which $I(\xi,\eta)$ is finite is given. Finally some properties of this expression are discussed.

YAGLOM, A. M., OBUKHOV, A. M.

"On Microstructure of Atmospheric Turbulence," paper submitted at International Assoc, of Meteorology Meetings, Toronto, Canada, 3-14 Sep 57

C-3,800,327

YAGLOM, A.M.

YAGLOM, A.M.

KONDRATYEV, K.Ya.

3(7)

PHASE I BOOK EXPLOITATION SOV/1685

Akademiya nauk SSSR. Komitet po geodezii i geofizike.

Tezisy dokladov na XI General'noy assambleye Mezhdunarodnogo geodezicheskogo i geofizicheskogo soyuza. Mezhdunarodnaya assotsiatsiya meteorologii (Abstracts of Reports at the 11th General Assembly of the International Union of Geodesy and Geophysics. The International Association of Meteorology) Moscow, 1957. 38 p. /Parallel texts in Russian and English or French/ 1,500 copies printed. No additional contributors mentioned.

PURPOSE: This booklet is intended for meteorologists.

COVERAGE: These reports cover various subjects in the field of meteorology. Among the specific subdivisions discussed are: the heat balance of the Earth's surface, jet streams, transference of heat radiation, electric coagulation of cloud particles, turbulent diffusion, cloud studies, and others. Abstracts of all the articles are translated into either French or English. There are no references given.

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Abstracts of Reports (Cont.) SOV/1685

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YAGLOM, A. M.

PHASE I BOOK EXPLOITATION 16

AKIVA MOISEYEVICH

Yaglom, A. M., and Yaglom, I. M.

Veroyatnost' i informatsiya (Probability and Information) Moscow, GITTL, 1957. 159 p. 30,000 copies printed.

Ed.: Goryachaya, M. M.; Tech. Ed.: Gavrilov, S. S.; Reviser: Moiseyeva, Z. V.

PURPOSE: The book is designed for people without higher mathematical education. The authors' main task was to acquaint the general reader with certain not-too-complicated, but very important mathematical concepts and their application in modern engineering.

COVERAGE: The fundamentals of the classic theory of probability and the general concept of probability in connection with Boolian algebra are presented. The concepts of entropy and information are introduced and their mathematical formulation given. The importance of the concepts of entropy and information is illustrated by certain logical problems. The concepts of a code and of its economy are introduced.

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Probability and Information

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The binary code is described and its economy studied. The binary code is extended into the code of m signals. Special attention is paid to the Shannon-Fano Code and to Shannon's work in information theory. The fundamentals of the Shannon-Fano Code and its efficiency are demonstrated. The transmission of a message, when communication line disturbances are present is discussed. The concepts of the speed of transmission and the carrying capacity of communication lines are introduced and formulas given. No proofs are given for the formulas and only one individual case given by A. N. Kolmogorov is studied. There are 8 references mentioned in the introduction and in footnotes, 7 of which are Soviet and 1 English. In the introduction the authors thank Academician A. N. Kolmogorov for his valuable advice. They also thank editor M. M. Goryachaya for her remarks concerning the arrangement of the book material.

Card 2/4

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Probability and Information

AVAILABLE: Library of Congress

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LK/bmd
27 June 1958

GRADSHTEYN, I.S. (Moscow) ROFE-BEKETOV, F.S. (Khar'kov); MINLOS, R.A. (Moscow) SKOPETS, Z.A. (Yaroslavl'); GEL'FOND, A.O. (Moscow); YAGLOM, A.M. (Moscow); ROBINSON, R.M. (SShA); DUBNOV, Ya.S. (Moscow); STECHKIN, S.B. (Moscow)

Problems of higher mathematics. Mat. pros. no.1:224-227 '57.

(Mathematics--Problems, exercises, etc.) (MIRA 11:7)

YAGLOM, A. M.

AUTHOR: Yaglom, A. M. 52-3-2/9

TITLE: Certain Types of Random Fields in n-dimensional Space Similar to Stationary Stochastic Processes (Nekotoryye klassy sluchaynykh poley v n-mernom prostranstve, rodstvennyye statsionarnym sluchaynym protsessam).

PERIODICAL: Teoriya Veroyatnostey i Yeye Primeneniya, 1957, Vol.II, Nr.3. pp. 292-337. (USSR)

ABSTRACT: The purpose of this paper is to establish a spectral theory for certain types of random fields and random generalized fields (multidimensional random distributions) in the Euclidian n-space R_n similar to the well-known spectral theory for stationary random processes. Let D denote the Schwartz space of all complex-valued C_∞-functions $\varphi(\underline{x})$ defined on R_n whose carrier is compact. Following Itô (Ref.6) and Gelfand (Ref.7) we shall call the random linear functional $\xi(\varphi)$ on D satisfying

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$$\lim_{\varphi_1 \to \varphi} \underline{M} \left| \xi(\varphi_1) - \xi(\varphi) \right|^2 = 0 \qquad \text{(Eq. 1.4)}$$

the random generalized field. We can identify a continuous random field $\xi(x)$ on R_n with a random generalized field

$$\xi(\varphi) = \int_{R_n} \xi(\underline{x})\,\varphi(\underline{x})\,d\underline{x}, \quad d\underline{x} = dx_1 \ldots dx_n \qquad (\text{Eq. } 1.5)$$

and therefore we can consider the ordinary random fields $\xi(\underline{x})$ as special cases of random generalized fields. We shall only deal with the first moment $m(\varphi)$ and the second moment $B(\varphi_1, \varphi_2)$ of the random generalized field $\xi(\varphi)$ and shall call them a mean value functional and a covariance functional of this field. For an ordinary random field the mean value and covariance function defined by

$$\underline{M}\,\xi(\underline{x}) = m(\underline{x}), \quad \underline{M}\,\xi(\underline{x}_1)\,\overline{\xi(\underline{x}_2)} = B(\underline{x}_1, \underline{x}_2) \qquad (\text{Eq. } 1.1)$$

play a similar role. The random generalized field $\xi(\varphi)$ is called homogeneous if its mean value functional $m(\varphi)$

Certain Types of Random Fields in n-dimensional Space Similar to Stationary Stochastic Processes. 52-3-2/9

and covariance functional $B(\varphi_1, \varphi_2)$ are invariant under all shift transformations in the space D, i.e. if the relations $m(\varphi) = m(\tau_Y \varphi)$, and $B(\varphi_1, \varphi_2) = B(\tau_Y \varphi_1, \tau_Y \varphi_2)$ hold true. The theory of this homogeneous random generalized field, which is very similar to Itô's theory of a stationary random distribution (Ref.6), is treated in section 2. The main results of the section concern the spectral representation of the covariance functional of such fields and of random generalized fields themselves. Let D_1 denote the subspace of the space D consisting of all functions $\varphi(x)$ satisfying

$$\int_{R_n} \varphi(\underline{x})\, d\underline{x} = 0 \qquad \text{(Eq. 3.1)}$$

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The continuous linear functional $\xi(\varphi)$ on D_1 is called a locally homogeneous random generalized field if its mean

value functional $m(\varphi)$ and its covariance functional $B(\varphi_1, \varphi_2)$ are invariant under all shift transformations in D_1. The locally homogeneous random fields mentioned above are treated in section 3. In this section we obtain the spectral representation of a covariance functional of the locally homogeneous random generalized field and the spectral representation of this field itself; these results generalize the spectral theory for random processes with stationary increments. The homogeneous random generalized field is called homogeneous and isotropic if its mean value functional $m(\varphi)$ and covariance functional $B(\varphi_1, \varphi_2)$ are invariant under all transformations in D induced by orthogonal transformations (motions and reflections) in the space R_n. In the case of the n-dimensional random generalized field $\underline{\xi}(\varphi) = \{\xi_1(\varphi), \ldots, \xi_n(\varphi)\}$ its mean value functional $\underline{m}(\varphi) = \{m_1(\varphi), \ldots, m_n(\varphi)\}$ forms a vector in R_n and its covariance functionals

Certain Types of Random Fields in n-dimensional Space Similar to Stationary Stochastic Processes. 52-3-2/9

$B_{if}(\varphi_1, \varphi_2)$ form a tensor in R_n. The n-dimensional homogeneous field $\xi(\varphi)$ is called a homogeneous and isotropic random generalized vector field if the vector and the tensor are invariant under all motions and reflections in R_n and the simultaneous transformations in D induced by this motion or reflection. Homogeneous and isotropic random generalized fields and random generalized vector fields are treated in section 4. In this section we obtain the general form of the functionals $m(\varphi)$ (or $\underline{m}(\varphi)$) and $B(\varphi_1, \varphi_2)$ (or $B_{ij}(\varphi_1, \varphi_2)$) for these fields. The locally homogeneous random generalized field $\xi(\varphi), \varphi \in D$, is called locally homogeneous and locally isotropic if its mean value functional $m(\varphi)$ and covariance functional $B(\varphi_1, \varphi_2)$ are invariant under all transformations in D_1 induced by orthogonal transformations in R_n; it is also clear how we can define the notion of the locally homogeneous and locally isotropic random generalized vector field $\underline{\xi}(\varphi)$, $\varphi \in D_1$. Locally homogeneous and locally isotropic random generalized vector fields are treated

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Certain Types of Random Fields in n-dimensional Space Similar to Stationary Stochastic Processes. 52-3-2/9

in section 5. Here we obtain the general form of the mean value functional and of the covariance for these fields; in particular, we obtain the general form of a mean value and of a covariance function of ordinary random fields (scalar and vector) which are locally homogeneous and locally isotropic in the sense of Kolmogorov (Ref.17). There are 31 references, 18 of which are Slavic.

SUBMITTED: May 7, 1957.

AVAILABLE: Library of Congress.

Card 6/6

YAGLOM, A.M.

SOV/52-2-4-7/7

A Summary of Papers Presented at the Sessions of the Scientific Research Seminar on the Theory of Probabilities. Moscow, Feb-May 1957.

Teoriya Veroyatnostey i yeye Primeneniya, 1957, v. 2, No. 4, pp. 478-88

and $x = l$. If this condition is not fulfilled, then there is a unique solution of Eq.1 taking given values at $t = 0$ and $x = l$.

Yaglom, A.M., Generalized locally homogeneous stochastic fields. The contents of this paper have been published in Vol.2, Nr.3 of this journal. Seregin, L.V., Continuity conditions with unit probability of strictly Markov processes. The results are to be published in this journal. Yushkevich, A.A., Strong Markov processes. The results were published in Vol.2, Nr.2 of this journal. Tikhomirov, V., On ε-entropy for certain classes of analytic functions. The contents of this report have been published in Doklady Akademii Nauk, Vol.117, Nr.2, 1957, p.191. Urbanik, K., (Wroclaw), Generalised distributions at a point of generalised stochastic processes. The generalised stochastic processes are of finite order, i.e. are generalised derivatives of continuous processes. It is proved that the distribution at a point of a generalised process is uniquely defined. Girsanov, I.V., Strongly

Card ~~3/11~~ 1/1

SUBJECT USSR/MATHEMATICS/Theory of probability CARD 1/4 PG - 731
AUTHOR GELFAND I.M., JAGLOM A.M.
TITLE The computation of the set of communication about a random function contained in an other random function.
PERIODICAL Uspechi mat.Nauk 12, 1, 3-52 (1957)
reviewed 5/1957

The first chapter in essential corresponds to the appendix 7 of Shannon and Weaver "A mathematical theory of communication" but it contains some new results. Let ξ and η be discrete random terms which can attain the values x_i $(i=1,2,\dots,n)$ and y_k $(k=1,2,\dots,m)$ with the probabilities $P_\xi(i)$ and $P_\eta(k)$. Let $P_{\xi\eta}(i,k)$ be the probability that at the same time ξ attains the value x_i and η the value y_k. The set of communication about η contained in ξ then reads

$$I(\xi,\eta) = \sum_{i=1}^{n}\sum_{k=1}^{m} P_{\xi\eta}(i,k)\log\frac{P_{\xi\eta}(i,k)}{P_\xi(i)\,P_\eta(k)}.$$

For arbitrary (not discrete) ξ and η the set of communication is defined as

$$I(\xi,\eta) = \sup I\left[\xi(\Delta_1,\Delta_2,\dots,\Delta_n),\eta(\Delta'_1,\Delta'_2,\dots\Delta'_m)\right],$$

where the sup has to be taken over all possible subdivisions of the ranges of values of ξ and η into finite numbers of free of common points intervals Δ_i and Δ'_k, respectively.

It is stated that in general the dependence of the set of communication $I(\xi, \eta)$ on the probability distribution of the pair of vectors (ξ, η) is discontinuous, but that always

$$I(\xi, \eta) \leq \underline{\lim}_{n \to \infty} I(\xi_n, \eta_n)$$

if the sequence (ξ_n, η_n) converges to (ξ, η) with respect to the probability distribution.

A further new result is contained in the theorem: In order that $I(\xi, \eta)$ is finite, it is necessary and sufficient that the probability distribution $P_{\xi\eta}$ is absolutely continuous with respect to the distribution $P_\xi \cdot P_\eta$. Then

$I(\xi, \eta) = \int \alpha(x,y) \log \alpha(x,y) \, dP_\xi(x) \, dP_\eta(y)$, where

$$(x,y) = \frac{dP_{\xi\eta}(x,y)}{dP_\xi(x) dP_\eta(y)} .$$

The second chapter contains an effective computation of $I(\xi, \eta)$ if the more-dimensional distributions of the probabilities of ξ, η and (ξ, η) are Gaussian. In this case we have

$$(1) \qquad I(\xi, \eta) = \frac{1}{2} \log \frac{\det A \cdot \det B}{\det C},$$

where A, B, C are the matrices of the second moments of ξ, η and $\zeta = (\xi, \eta)$. If H is the space spanned over all terms ξ_i, η_i and if to the vectors ξ and η there correspond the subspaces H_1 and H_2, if P_1 and P_2 are the operators projecting on H_1 and H_2, then

$$I(\xi, \eta) = -\frac{1}{2} \log \det (E - P_1 P_2 P_1).$$

For the concrete computations the authors use a formula which follows from (1) by putting

$$C_1 = \begin{pmatrix} A & 0 \\ 0 & B \end{pmatrix} \qquad C_1^{-1} = \begin{pmatrix} A^{-1} & 0 \\ 0 & B^{-1} \end{pmatrix}.$$

Then

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$$\frac{\det A \det B}{\det C} = \left\{\det(CC_1^{-1})\right\}^{-1} = \begin{vmatrix} E & DB^{-1} \\ D^1A^{-1} & E \end{vmatrix}^{-1}$$

and

$$I(\xi, \eta) = -\frac{1}{2} \log \det (E - DB^{-1}D^1A^{-1}).$$

On the basis of these preparations several examples for the computation of the set of communication are computed.

LEBEDEV, Vsevolod Leonidovich; RYTOV, S.M., prof., retsenzent; YAGLOM, A.M., doktor fiz.-mat.nauk, retsenzent; KOSTIYENKO, A.I., ~~kand.fiz.-mat. nauk~~, red.; AKHLAMOV, S.N., tekhn.red.

[Random processes in electric and mechanical systems] Sluchainye protsessy v elektricheskikh i mekhanicheskikh sistemakh. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1958. 176 p. (MIRA 12:2)
(Probabilities)

YAGLOM, A.M.

"Theory of Random Fields."

[Academy of Sciences USSR]

report to be presented 26 July 1960 at the 4th Symposium on Mathematics Statistics and Probability - Berkeley, California, 20 Jun- 30 Jul 1960.

PINSKER, Mark Semenovich; YAGLOM, A.M., otv. red.; SOLOMONOV, V.G., zamestitel' otv. red.; SOROKIN, I.P., red.izd-va; VOLKOVA, V.V., tekhn.red.

[Information and the informational stability of random quantities and processes] Informatsiia i informatsionnaia ustoichivost' sluchainykh velichin i protsessov. Moskva, Izd-vo Akad.nauk SSSR, 1960. 201 p. (Problemy peredachi informatsii, no.7). (MIRA 14:8)
(Information theory)

16.6100

Z/507/60/000/000/002/005
B125/B112

AUTHOR: Yaglom, A. M. (Moscow)

TITLE: Explicit formulas for the extrapolation, filtration, and calculation of the information content in the theory of Gaussian stochastic processes

SOURCE: Conference on Information Theory, Statistical Decision Functions, Random Processes. 2d, Prague, 1959. Transactions. Prague, Czsl. Academy of Sciences, 1960. 843p. biblio. 251-262

JA

TEXT: This is a survey of some studies of information theory and the theory of extrapolation and filtration of stochastic processes. These studies have been made during the last few years in Moscow. Special allowance is made for stationary, Gaussian stochastic processes $\xi(t)$ with continuous argument. Owing to the stationary character also spectral functions can be used instead of the correlation functions $B(t_1,t_2)$ or the functionals $B(\varphi_1,\varphi_2)$. These spectral functions must be determined from the equations

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$$B(t_1, t_2) = \int_{-\infty}^{\infty} e^{i(t_1 - t_2)\lambda}\, dF(\lambda) \qquad (1)$$

or

$$B(\varphi_1, \varphi_2) = \int_{-\infty}^{\infty} \tilde{\varphi}_1(\lambda)\, \overline{\tilde{\varphi}_2(\lambda)}\, dF(\lambda)\,, \quad \tilde{\varphi}(\lambda) = \int_{-\infty}^{\infty} e^{i\lambda t} \varphi(t)\, dt\,. \qquad (1')$$

JA

When a stationary process $\xi(t)$ is extrapolated then the functional of the values $\xi(t)$ has to be determined. In the Gaussian case $\xi(t,\tau) = \int_0^T \xi(t-s)w(s)ds$, (2), where w is a generalized function. The explicit formulas can be determined only for some special cases. In the most important of these cases the spectral density is rational with respect to λ. The Fourier transform $\Phi(\lambda) = \int_0^T e^{-is\lambda} w(s)ds$ of the

generalized function w(s) is a rational function analytic in the lower semi-plane, or an integral function of the form

$\Phi(\lambda) = \Phi_1(\lambda) + e^{-iT}\Phi_2(\lambda)$. $\Phi_1(\lambda)$ and $\Phi_2(\lambda)$ are rational functions if T is finite. The filtration problem of the stationary process $\xi(t)$ consists in determining the functional $\bar{\eta}$ (of the values $\xi(t')$) with the best approximation to a fixed random quantity η. The filtration problem is solved similarly to the extrapolation problem if $\Phi(\lambda)$ is given by

$$\Phi(\lambda) = \sum_{k=0}^{N_1} Q_k(\lambda)\, e^{-i(t-t_k)\lambda} + \Phi_1(\lambda) + e^{-iT\lambda}\Phi_2(\lambda) \qquad (7).$$

This solution is valid almost without change for the generalized stationary process ξ with rational spectral density. The problems of extrapolation, filtration, and interpolation discussed here can be generalized as follows: for the best approximation by a linear functional of the values of the stationary process $\xi'(t)$ in a finite number of intervals not intersecting each other, for the sum of a stationary

√A

Explicit formulas for the ... Z/507/60/000/000/002/005
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stochastic process, for a function $f(\lambda)$ with a singularity at $\lambda = 0$ and for multidimensional extensions of the above problem. The content of information is

$$I\{\xi_T, \eta_T\} = \frac{1}{2}\log\left\{\frac{\sqrt{1+k} + (1+\frac{1}{2}k)}{2\sqrt{1+k}} e^{\tau(\sqrt{1+k}-1)} + \right.$$
$$\left. + \frac{\sqrt{1+k} - (1+\frac{1}{2}k)}{2\sqrt{1+k}} e^{-\tau(\sqrt{1+k}+1)}\right\}, \qquad (24)$$

JA

if $f_{\zeta\zeta}(\lambda) = f_0 = \text{const}$ and $\xi = \xi(t)$ is an ordinary stationary process with rational spectral density. $k = f_0 + ^2/A = f_0/f_{\xi\xi}(0)$ and $\tau = \alpha T$. The formula for the specific information is

$$i(\xi, \eta) = -\frac{1}{4\pi}\int_{-\infty}^{\infty}\log\left[1 - \frac{f_{\xi\zeta}(\lambda)}{f_{\zeta\zeta}(\lambda)}\right]d\lambda. \qquad (26).$$

Card 4/5

Explicit formulas for the ... Z/507/60/000/000/002/005
B125/B112

ASSOCIATION: Institut fiziki atmosfery AN SSSR (Institute of Physics of the Atmosphere AS USSR)

JA

Card 5/5

PHASE I BOOK EXPLOITATION SOV/4175

Yaglom, Akiva Moiseyevich, and Isaak Moiseyevich Yaglom

Veroyatnost' i informatsiya (Probability and Information). 2d ed., rev. and enl. Moscow, Fizmatgiz, 1960. 315 p. 25,000 copies printed.

Ed.: M.G. Shur; Tech. Ed.: S.N. Akhlamov.

PURPOSE: This book, the second edition, is intended for students of higher grades of secondary schools, university students, teachers in secondary schools and schools of higher education, communications engineers, and specialists in physics, biology, linguistics, etc.

COVERAGE: The book is an introduction to a new field of mathematics, information theory, which is closely connected with cybernetics and has applications in biology, linguistics, and communications. Data on the theoretical and informational characteristics of specific kinds of messages (written and oral speech, phototelegrams, television) are cited. The authors thank A.N. Kolmogorov for his advice on the first edition and acknowledge the assistance given by the

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following on the second edition: S.G. Gindikin, V.I. Levenshteyn, P.S. Novikov, I.A. Ovseyevich, S.M. Rytov, V.A. Uspenskiy, G.A. Shestopal, M.I. Eydel'nant, R.L. Dobrushin, A.A. Kharkevich, V.A. Garmash, L.R. Zinder, D.S. Lebedev, and T.N. Moloshna. There are 54 references: 29 Soviet (including translations), 21 English and 4 German.

TABLE OF CONTENTS:

YAGLOM, A.M.

"Using the ideas of the theory of information for determining the time of psychological reactions," by W.E.Hick and R.Hyman. Mat. pros. no.5:246-252 '60. (MIRA 13:12)

(Information theory)

(Hick,W.E.) (Hyman,R.)

83217

S/052/60/005/003/001/002
C 111/C222

16.4100

AUTHOR: Yaglom, A.M.

TITLE: Effective Solutions of Linear Approximation Problems for Multivariate Stationary Processes With a Rational Spectrum

PERIODICAL: Teoriya veroyatnostey i yeye primeneniye, 1960, Vol.5, No.3, pp.265-292.

TEXT: The author considers multivariate stationary processes $\xi(t) = \{\xi_1(t), \ldots, \xi_n(t)\}$, $-\infty < t < \infty$, with

(1.1) $$M\xi_k(t) \equiv 0.$$

The author restricts himself to the case where all elements $B_{jk}(t)$ of the correlation matrix

(1.2) $$\| B_{jk}(\tau) \| = \| M \xi_j(t+\tau) \overline{\xi_k(t)} \|$$

admit the integral representation

(1.3) $$B_{jk}(\tau) = \int_{-\infty}^{\infty} e^{i\tau\lambda} f_{jk}(\lambda) d\lambda$$

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Effective Solutions of Linear Approximation Problems for Multivariate Stationary Processes With a Rational Spectrum

in which all $f_{jk}(\lambda)$ are rational functions of λ. Processes which satisfy these conditions are called processes with a rational spectrum. It is shown that by a generalization of the method given by the author in (Ref.11,12) the effective solution of several linear approximation problems for these processes can be reduced to the solution of algebraic equations ($\det \| f_{jk}(\lambda) \| = 0$) and systems of equations. The author's method in essential is the same as used by S.Darlington (Ref.13). The author considers: the determination of linear least-square estimates of $\xi_k(t+\tau)$, $\tau > 0$, from the values of $\xi_j(t')$, $j=1,\dots,n$, where either $t' \leq t$ or $t-T \leq t' \leq t$ or where $0 < \tau < T$ and $t' \leq t$ resp. $t' \geq t+T$; furthermore a problem of filtration. Finally the author defines a number of further problems which can be solved effectively with the same method. The author mentions M.G.Kreyn. There are 17 references: 7 Soviet, 7 American, 1 French and 2 Swedish.

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SUBMITTED: July 15, 1959

Card 2/2

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C 111/ C 333

AUTHOR: Yaglom, A. M.

TITLE: Positively Defined Functions and Homogeneous Random Fields on Groups and Homogeneous Spaces

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 6, pp. 1342-1345

TEXT: The author considers only separable locally bicompact groups of the type I (see (Ref.6,8)). Let $\hat{G}$ be a "dual object" of the group G of the type I, i. e. the set of all classes of mutually equivalent irreducible unitary representations of this group. According to Mackey (Ref.6) let the "natural Borel structure" - Borel field $\mathfrak{A}$ of the "measurable" sets $\Lambda \subset \hat{G}$ - be defined in $\hat{G}$. Let $\{T^{(\lambda)}(g)\}$ be one of the representations of G correspon-ding to the point $\lambda \in \hat{G}$ and acting in the Hilbert space $H^{(\lambda)}$. If all $H^{(\lambda)}$ are identified with the same dimension, then $\hat{G}$ is the union of sets $\hat{G}_n$, $n = \infty, 1, 2, \ldots$, the intersection of which is void and which correspond to the classes of the equivalent n-dimensional unitary irreducible representations in an n-dimensional unitary H_n. Let $F(\Lambda)$ - "operator measure" on $\hat{G}$ - be a denumerably additive function on $\mathfrak{A}$, the values of which are

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Positively Defined Functions and Homogeneous Random Fields on Groups and Homogeneous Spaces

Hermitian nonnegative linear operators in H_n for $\Lambda \subset \hat{G}_n$.

Let

(1) $B(g) = \int_{\hat{G}} \mathrm{Tr} \left\{ T^{(\lambda)}(g) F(d\lambda) \right\}$

exist, where Tr is the trace and the integral is to be extended over all $\hat{G}_n \subset G$.

Theorem 1: Every continuous positive-definite function on the group G of the type I admits a representation (1), where $F(\Lambda)$ is the "operator measure" on $\hat{G}$, where $\mathrm{Tr}\, F(\hat{G}) < \infty$.

As random field on G there is denoted a function $\xi(g)$, the values of which lie in the Hilbert space $\mathfrak{H}$ of the complex random variables with mathematical expectation zero and bounded dispersion, and which is continuous in $\mathfrak{H}$ in the sense of the strong topology. The field $\xi(g)$ is homogeneous, if

(2) $\underline{M}\, \xi(g_1)\overline{\xi(g_2)} = \underline{M}\, \xi(gg_1)\overline{\xi(gg_2)}$

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Positively Defined Functions and Homogeneous Random Fields on Groups and Homogeneous Spaces

holds for every $g \in G$, where M is the mathematical expectation. Let $Z(f_1, f_2)$ with $MZ(f_1, f_2) \equiv 0$ be a random function. Assume that it linearly depends on the vector f_1 of the Hilbert space H and antilinearly on $f_2 \in H$, in signs: $Z(f_1, f_2) = (Zf_1, f_2)$, where Z is the random linear operator. Let $\mathfrak{L}(H)$ be the linear space of all random linear operators in H. Let the random operator measure on $\hat{G}$ be defined as denumerably additive function $Z(\Lambda)$ on $\mathfrak{A}$ with the values $Z(\Lambda) \in \mathfrak{L}(H_u)$ for $\Lambda \subset \hat{G}_u$.

Theorem 2: Every homogeneous random field $\xi(g)$ on G of the type I admits the representation

$$(4) \quad \xi(g) = \int_{\hat{G}} \mathrm{Tr}\left\{ T^{\lambda}(g)\, Z(d\lambda) \right\},$$

where $Z(\Lambda)$ is the random operator measure which satisfies the orthogonality condition

$$(3) \quad M(Z(\Lambda_1) f_1, f_2)(Z(\Lambda_2) g_1, g_2) = (f_1, g_1)(F(\Lambda_1 \cap \Lambda_2) g_2, f_2).$$

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C 111/ C 333

Positively Defined Functions and Homogeneous Random Fields on Groups and Homogeneous Spaces

Theorems 3 and 4 give analogous statements on the representations on homogeneous topological spaces.

D. A. Raykov and J. M. Gel'fand are mentioned in the paper; the author thanks N. Ya. Vilenkin, J. M. Gel'fand and M. A. Naymark for discussions.

There are 13 references: 5 Soviet, 3 French and 5 American.

ASSOCIATION: Institut fiziki atmosfery Akademii nauk SSSR (Institute of Physics of the Atmosphere of the Academy of Sciences USSR)

PRESENTED: July 4, 1960, by A. N. Kolmogorov, Academician

SUBMITTED: June 20, 1960

Card 4/4

YAGLOM, Akiva M.

Some models generalizing the model of homogeneous turbulence.

report submitted for the Intl. Symposium on Fundamental Problems in Turbulence and their relation to geophysics, IUGG and IUTAM, Marseilles, France, 4-9 Sep 1961.

YAGLOM, A. M. (USSR)

"Some Mathematical Models Generalizing the Model of Homogeneous and Isotropic Turbulence."

Presented at the International Symposium on Fundamental Problems in Turbulence and Their Relation to Geophysics, Marseille, France, Sept. 4-9, 1961

YAGLOM, A.M. (Moskva)

"Introductory probability and statistical inference; an experimental course"[in English] and "Teachers' notes and answer guide." [in English]. Reviewed by A.M.IAglom. Mat.pros. no.6:355-361 '61. (MIRA 15:3)

(United States--Mathematics--Study and teaching)

GAL'PERIN, Yuriy Il'ich; YERSHKOVICH, Aleksandr Isaakovich; YAGLOM, A.M., prof., red.; FAYNBOYM, I.B., red.; RAKITIN, I.T., tekhn. red.

[Auroras]Poliarnye siianiia. Pod red. A.M.IAgloma. Moskva, Izd-vo "Znanie," 1962. 24 p. (Novoe v zhizni, nauke, tekhnike. IX Seriia. Fizika i khimiia, no.2) (MIRA 16:1)
(Auroras)

KEYLIS-BOROK, Vladimir Isaakovich; NERSESOV, Igor' Leonovich; YAGLOM, Akiva Moiseyevich; SADOVSKIY, M.A., otv. red.; MEDER, V.M., red. izd-va; YEPIFANOVA, L., tekhn. red.

[Methods of evaluating the economic effect of earthquakeproof construction]Metodika otsenki ekonomicheskogo effekta seismostoikogo stroitel'stva. Moskva, Izd-vo Akad. nauk SSSR, 1962. 45 p. (MIRA 16:3)

1. Chlen-korrespondent Akademii nauk SSSR (for Sadovskiy).
(Earthquakes and building)

VOROB'YEV, N.N., red.; GNEDENKO, B.V., red.; DOBRUSHIN, R.L., red.; DYNKIN, Ye.B., red.; KOLMOGOROV, A.N., red.; KUBILYUS, I.P. [Kubilius, I.P.], red.; LINNIK, Yu.V., red.; PROKHOROV, Yu.V., red.; SMIRNOV, N.V., red.; STATULYAVICHYUS, V.A.[Statuliavicius, V.A.], red.; YAGLOM, A.M., red.; MELINENE, D., red.; PAKERITE,O., tekhn. red.

[Transactions of the Sixth Conference on Probability Theory and Mathematical Statistics, and of the Colloquy on Distributions in Infinite-Dimensional Spaces]Trudy 6 Vsesoiuznogo soveshchaniia po teorii veroiatnostei i matematicheskoi statistike i kollokviuma po raspredeleniiam v beskonechnomernykh prostranstvakh. Vilnius, Palanga, 1960. Vil'nius, Gos.izd-vo polit. i nauchn. lit-ry Litovskoi SSR, 1962. 493 p. (MIRA 15:12)

1. Vsesoyuznoye soveshchaniye po teorii veroyatnostey i matematicheskoy statistike i kollokviuma po raspredeleniyam v beskonechnomernykh prostranstvakh. 6th, Vilnius, Palanga, 1960.
(Probabilities--Congresses) (Mathematical statistics--Congresses) (Distribution (Probability theory))--Congresses)

YAGLOM, A.M.

Transactions of the 6th Conf. on Probability Theory and Mathematical Statistics and of the Symposium on Distributions in Infinite-Dimensional Spaces held in Vil'nyus, 5-10 Sep '60. Vil'nyus Gospolitizdat Lit SSR, 1962. 493 p. 2500 copies printed

Card 12/17

MONIN, A.S. (Moskva); YAGLOM, A.M. (Moskva)

Hydrodynamic instability and the appearance of turbulence; review. PMTF no.5:3-38 S-O '62. (MIRA 16:1)
(Hydrodynamics) (Turbulence)

YAGLOM, A.M.

Symposium on the study of time series. Vest. AN SSSR 32 no.11:119-120 N '62. (MIRA 15:11)
(Time-series analysis)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001961810017-7"

YAGLOM, A.M.

Mathematical theory of random functions. Izv. AN SSSR. Tekh. kib. no.5:107-112 S-O '63. (MIRA 16:12)

FORTUS, M.I.; YAGLOM, A.M.

Evaluation of the coefficients of the linear combination of defined functions in the presence of noise with rational spectra. Probl. pered. inform. no.14:136-150 '63. (MIRA 16:12)

MONIN, A.S.; YAGLOM, A.M.

Laws governing small-size turbulent motions of liquids and gases.
Usp. mat. nauk 18 no.5:93-114 S-O '63. (MIRA 16:12)

MONIN, Andrey Sergeyevich; YAGLOM, Akiva Moiseyevich; GOLITSYN, G.S., red.

[Statistical fluid mechanics] Statisticheskaia gidromekhanika. Moskva, Nauka. 1965. 639 p. (MIRA 18:3)

L 52554-65 EWT(l)/FCC GW

ACCESSION NR: AP5009234 UR/0362/65/001/002/0157/0166 10 8 B

AUTHOR: Yaglom, A. M.

TITLE: Lagrangian properties of turbulence in the diabatic surface layer and in convective jets

SOURCE: AN SSSR. Izvestiya. Fizika atmosfery i okeana, v. 1, no. 2, 1965, 157-166

TOPIC TAGS: Lagrange turbulence characteristic, atmospheric convection jet, atmospheric ground layer, ground layer turbulence, diabatic surface layer

ABSTRACT: Numerous earlier studies of turbulent atmospheric motion are characterized by the use of semiempirical hypotheses (see, e.g., F. A. Gifford, J. Geophys. Res., 67, no. 8, 1962; J. E. Cermak, J. Fluid Mech., 15, no. 1, 1963; R. C. Malhotra, J. E. Cermak, J. Geophys. Res., 68, no. 8, 1963). In the present article, in an attempt to achieve a more rigorous approach to the problem, similarity and dimensional arguments are used for the study of Lagrangian statistical properties of turbulence in convective jets over heated bodies and in the diabatic surface layer. The Lagrangian properties are assumed to be defined by the same physical parameters as the more usual Eulerian properties. It is possible to deduce from this assumption a general form of the probability distribution for the coordinates of a "liquid particle" moving within turbulent flows and to

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obtain data on the mean value of the Lagrangian velocity and the Lagrangian dispersion tensor. The expression for the decrease in the admixture cloud concentration with time is found for the case when the cloud originates from instantaneous sources and the corresponding expression for the concentration decrease in space is found for continuously acting stationary sources. "The author thanks G. K. Batchelor for his interesting manuscript (Diffusion from sources in a turbulent boundary layer, 1959)." Orig. art. has: 29 formulas.

ASSOCIATION: Institut fiziki atmosfery Akademii nauk SSSR (Institute for Atmospheric Physics, Academy of Sciences, SSSR)

SUBMITTED: 10Oct64 ENCL: 00 SUB CODE: ES, ME

NO REF SOV: 004 OTHER: 011

Card 2/2

YAGLOM, A.M.

Effect of fluctuations in energy dissipation on the form of turbulence characteristics in an inertial interval. Dokl. AN SSSR 166 no.1:49-52 Ja '66. (MIRA 19:1)

1. Institut fiziki atmosfery AN SSSR. Submitted May 5, 1965.

L 23534-66 EWT(1)/FCC GW

ACC NR: AP6003482 (N) SOURCE CODE: UR/0020/66/166/001/0049/0052

AUTHOR: Yaglom, A. M.; Kolmogorov, A. N. (Academician) 31

ORG: Institute for the Physics of the Atmosphere of the AN SSSR (Institut fiziki atmosfery AN SSSR) B

TITLE: The effect of fluctuations in the dissipation of energy on the form of the turbulence characteristics in an inertial interval

SOURCE: AN SSSR. Doklady, v. 166, no. 1, 1966, 49-52

TOPIC TAGS: atmospheric turbulence, kinetic energy conversion

ABSTRACT: An important part of the modern theory of the local structure of developed turbulence is the "two-thirds" law proposed by Kolmogorov and Obukhov for the longitudinal and transverse structural functions of the velocity field $D_{LL}(r)$ and $D_{NN}(r)$ in the inertial interval $L \gg r \gg \eta$ (where L and η are the external and internal scales of the turbulence), and the corresponding "five-thirds" law for the velocity spectrum $E(k)$ in the interval $1/L \ll k \ll 1/\eta$. It has been shown, however, that these laws cannot be completely exact because of the presence of random fluctuations of the quantity

$$\varepsilon = \frac{\nu}{2} \sum_{i,j} \left(\frac{\partial u_i}{\partial x_j} + \frac{\partial u_j}{\partial x_i} \right)^2, \qquad (1)$$

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UDC: 532.517.4

L 23534-66

ACC NR: AP6003482

which defines the rate of dissipation of kinetic energy. The aim of the present work is to show mathematically that the expression

$$E^{(1)}_{\varepsilon_1\varepsilon_1}(k) \sim k^{-0.8}. \quad (2)$$

can also be deduced from assumptions given in previous literature and that it can be combined with expressions for the deviation of the statistical characteristics of the turbulence by assumptions which are independent of experimental verification. Orig. art. has: 10 formulas.

SUB CODE: 04/ SUBM DATE: 12Apr65/ ORIG REF: 007/ OTH REF: 003

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ACC NR: AM7002476 Monograph UR/

~~AM5614099~~

Monin, Andrey Sergeyevich; Yaglom, Akiva Moiseyevich

Statistical hydromechanics; turbulence mechanics (Statisticheskaya gidromekhanika; mekhanika turbulentnosti) pt. 1. Moscow, Izd-vo "Nauka", 65. 0639 p. illus., biblio. 7,000 copies printed

TOPIC TAGS: turbulent flow, laminar flow, hydrodynamics, probability, similarity theory, fluid mechanics, correlation function, Reynolds equation

PURPOSE AND COVERAGE: This is the first of two volumes on the theory of turbulent flow in liquids and gases. Specifically, the authors are concerned with the statistical properties of ensembles of currents characterized by macroscopically similar conditions. Basic information is given on equations in hydromechanics and their simplest corollaries and the genesis of turbulence and hydrodynamic instability, including elements in the theory of nonlinear instability. The following are discussed at various lengths: the theory of probability; the

Card 1/3 UDC: 532.507

ACC NR: AM7002476

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theory of random fields; application of the concepts of dimensionality and similitude to turbulent flow in conduits, canals and boundary layers and to free turbulent flow; basic concepts in the semiempirical theory of turbulence; application of the theory of similitude to turbulence in a medium stratified vertically with respect to density; Lagrangian characteristics of turbulence; and the theory of turbulent diffusion. The book is intended for specialists in hydromechanics and theoretical physics. The authors express their thanks to A. M. Obukhov, L. A. Dikiy, Ye. A. Novikov, V. I. Tatarskiy, A. S. Gurvich, L. R. Tsvang (the latter two for their assistance on the subject of atmospheric turbulence), and G. S. Golitsyn.

TABLE OF CONTENT [abridged]:

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ACC NR: AM7002476
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SUB CODE: 20 / SUBM DATE: 10Dec64/ ORIG REF: 124/
OTH REF: 541

Yaglom, I. M.

Yaglom, I. M., and Yaglom, A. M. Tangential Poincaré models of plane geometries of constant curvature. C. R. (Doklady) Acad. Sci. URSS (N.S.) 53, 401–404 (1946).

In a Euclidean plane, an elliptic plane of curvature K^2 or a hyperbolic plane of curvature $-K^2$ determine an oriented straight line L by its angle φ with a fixed s-axis A and the abscissa s of the point $A \cap L$. Various agreements are necessary if $A \cap L$ is not defined. For instance, if in the hyperbolic plane L does not intersect A and is not parallel to A and d and s' are, respectively, the length (with a proper sign) and the abscissa of the foot of the common perpendicular of A and L, then $\varphi = id$ and $s = s' + iK^{-1}\pi/2$. Using three types of complex numbers $x+iy$ with $i^2=-1$, $x+\epsilon y$ with $\epsilon^2=0$, $x+ey$ with $e^2=1$, the number z defined by $z=\tan(\varphi/2)(\cos sK + i\sin sK)$ or $z=\tan(\varphi/2)(1+\epsilon s)$ or $z=\tan(\varphi/2)(\cosh sK + e\sinh sK)$ is called the complex coordinate of the line (φ, s) in the elliptic, Euclidean or hyperbolic plane, respectively ($\tan(\varphi/2)\cosh sK$ and $\tan(\varphi/2)\sinh sK$ are always real). After introduction of ideal lines the substitution $z' = (az+b)/(cz+d)$, where a, b, c, d, z are complex numbers of the same type and $ad-bc$ is not a zero divisor, yields a one-to-one mapping of the corresponding set of lines on itself. Exactly those substitutions correspond to motions in their respective planes for which d is conjugate to a and c to b. *H. Busemann.*

Source: Mathematical Reviews, Vol 8 No. 6

Yaglom, I. M.

Yaglom, I. M. On the groups of Moebius and Laguerre in planes of constant curvature. C. R. (Doklady) Acad. Sci. URSS (N.S.) 54, 297–300 (1946).

With the notation of the preceding review exactly those transformations $z' = f(z)$ are equilong for which $f(\ )$ is monogenic, that is, $f'(z)$ exists. The Laguerre transformations of any one of the three planes are the linear equilong transformations $z' = (az+b)/(cz+d)$ for which $ad-bc$ is not a zero divisor. They are characterized by the fact that they transform the family of nondegenerate tangential cycles into itself. The groups of the Laguerre transformations of the elliptic, Euclidean and hyperbolic planes are isomorphic to the groups of point transformations of the Euclidean plane which transform into itself the family of, respectively, the circles, the parabolas with a fixed axis direction and the equilateral hyperbolas with a fixed axis direction.

H. Busemann (Northampton, Mass.).

Source: Mathematical Reviews, Vol 8 No. 6

YAGLOM, I. M.

PA 17/49T73

USSR/Mathematics - Topology May/Jun 48
Mathematics - Geometry, Non-Euclidean

"Critical Reviews and Bibliographies" 6 pp

"Uspekhi Matemat Nauk" Vol III, No 3 (25)

Presents two book reviews: (1) V. Yefremovich reviews L. S. Pontryagin's "The Elements of Combinatorial Topology," and (2) I. M. Yaglom reviews E. Cartan's "The Geometry of Riemannian Spaces" (in French, published in Paris).

17/49T73

YAGLOM I. M.

27581. Proyektivnyye meroopredeleniya na ploskosti i kompleksnyye chisla. Trudy seminara po vektornomu i tenzornomu analizu s ikh prilozheniyami k geometrii mekhanike i fizike. Vyp. 7. M-L, 1949. s. 276-318.--Bibliogr: 7 nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 37, 1949.

YAGLOM, I. M.

27582. Tangentsial'naya metrika v dvuparametricheskom semeystve krivykh na ploskost', Trudy seminara po vektornomu i tenzornomu analizu s ikh prilozheniyemi k geometrii, mekhanike i fizike. Vyp. 7, M-L. 1949, s. 341-61. --Bibliogr: 7 nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 37, 1949

YAGLOM, I. M.

Yaglom, I. M. The Cayley-Klein metrics in the projective plane and complex numbers. Trudy Sem. Vektor. Tenzor. Analizu 7, 276–318 (1949). (Russian)

The nine Cayley-Klein projective metrics defined by real, imaginary, degenerate, or nondegenerate conics are treated in a lucid and uniform manner by the use of three systems of complex numbers: the usual $z=x+iy$; the dual numbers $z=x+\epsilon y$, $\epsilon^2=0$; and the elliptic complex numbers $z=x+\epsilon y$, $\epsilon^2=1$. There are no essentially new results except in the discussion of Poincaré models. After the coordination of the various geometries with their respective complex domains, the following topics are discussed: the representation of motion by means of linear fractional transformations; the equations of the cycles; equations for points and lines; Poincaré models; conformal and equilong mappings; Möbius and Laguerre transformations of the hyperbolic plane.

H. Busemann (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol 12 No. 5

YAGLOM, I. M.

Yaglom, I. M. The tangential metric in a two-parameter family of curves in the plane. Trudy Sem. Vektor. Tenzor. Analizu 7, 341–361 (1949). (Russian)

Let $F(u, v, \xi, \eta)$ represent a two-parameter family of curves in the plane in line coordinates u, v (ξ and η are the parameters). Let $u=U(\xi, \eta, d\eta/d\xi)$, $v=V(\xi, \eta, d\eta/d\xi)$ be the solutions of the conditions $F(u, v, \xi, \eta)=0$ and $F(u, v, \xi+d\xi, \eta+d\eta)=0$ for two infinitely near curves to have u, v as common tangent. The tangential distance of two curves of the family is defined by

$$d\sigma^2=(u^2+v^2)[(F_uF_{v\xi}-F_vF_{u\xi})d\xi - (F_uF_{v\eta}-F_vF_{u\eta})d\eta]^2(uF_u+vF_v)^{-4},$$

where u and v are understood to be the above functions U and V. Necessary and sufficient conditions are derived for this line element to have the Gaussian form, that is, the coefficient of $d\xi^2$, $d\xi d\eta$, $d\eta^2$, not to depend on $d\eta/d\xi$.

Instead of ordinary line coordinates u, v, the distance p of a line from the origin and the angle α of its normal with a fixed direction are introduced, and the forms of the line element corresponding to the above $d\sigma^2$ in the Euclidean, elliptic, and hyperbolic planes are derived. If no two different curves of the system have a common tangent, then $d\sigma^2$ (in any form) may be used as metric for the lineal elements of the plane. In that case the radius of curvature of a curve of the system at a point becomes a single-valued function of the lineal element, which is evaluated in the Euclidean and non-Euclidean cases. An extension to three-parameter families of curves in a three-dimensional Riemann space is indicated. *H. Busemann* (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol 12 No. 4

YAGLOM, I. M.

16(1) PHASE I BOOK EXPLOITATION SOV/1964

Moscow. Universitet. Nauchno-issledovatel'skiy institut matematiki

Trudy seminara po vektornomu i tenzornomu analizu s ikh prilozheniyami k geometrii, mekhanike i fizike, vyp. 8 (Transactions of the Seminar on Vector and Tensor Analysis and Their Applications to Geometry, Mechanics, and Physics; Nr 8) Moscow, Gostekhizdat, 1950. 449 p. 1,500 copies printed.

Ed. (Title page): V.F. Kagan, Professor; Ed. (Inside book): I.M. Yaglom; Tech. Ed.: N.Ya. Murashova.

PURPOSE: This book is intended for professional mathematicians, especially geometricians, and for physicists.

COVERAGE: This book contains some contributions to geometry presented by various leading Soviet mathematicians at the Seminar on Vector and Tensor Analysis, held from January 1, 1948, to July 1, 1949. Applications to physics and mechanics are not discussed in any detail. However, each article is significant for its possible applications in physics, especially the three articles by V. V. Vagner. In his

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article, "The Theory of a Complex Manifold," Vagner constructs a general theory of objects, which turns out to be a generalization of affinor analysis, and determines the operation of the absolute total differentiation, which is important to the applications of variational calculus, for the field of any local differential object. In his second article, "The Geometry of a Space with a Hyperareal Metric as the Theory of a Field of Local Hypersurfaces in a Complex Manifold," Vagner gives the construction of a geometry of a space with hyperareal metric in such a manner that its immediate application to a geometric interpretation of the corresponding variational problem is possible. In his last article, "Theory of a Field of Local Hyperstrips", Vagner discusses the geometry of a regular $n - 1$ dimensional hyperstrip in an n-dimensional central affine space as well as the theory of a field of local regular $n - 1$ dimensional hyperstrips in X_n and the application of this theory to rigid mechanical systems with nonlinear connections. The following persons submitted reports to the Seminar which are not contained in the book: A. P. Norden, V.F. Kagan, D.L. Pikus, N.N. Yanenko, B.A. Rosenfel'd, P.K. Rashevskiy, Ya.S. Dubnov, V.V. Vagner, I.M. Yaglom, A.Ye. Levashev, V.N. Skrydlov, D.P. Poloskov, M.O. Freydina, N.A. Meller, G.B. Gurevich, A.M. Lopshits, N.V. Yefimov, I.F. Yegorov, and Yu.A. Surinov.

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Transactions of the Seminar (Cont.) SOV/1964

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YAGLOM, I., M.

Pa. 173T57

USSR/Mathematics - Differential Geometry Jan/Feb 51

"Geometries of Simplest (Prime) Algebras," B. A. Rozenfel'd, Baku, I. M. Yaglom, Moscow

"Matemat Sbor" Vol XXVIII (70), No 1, pp 205-216

Headings: Three Geometries of the Field of Complex Numbers; Most Prime Algebras With Nondegenerate Norm; Three Geometries in Most Prime Algebras With Nondegenerate Norm; Multidimensional Generalization of Geometries of Most Prime Algebras With Nondegenerate

173T57

USSR/Mathematics - Differential Geometry (Contd) Jan/Feb 51

Norm; Relation Between the Binary and Pseudoquaternion Unitary Geometries on the One Side With Real Geometries on the Other Side; Geometries of Most Prime Algebras With Degenerate Norm. Submitted 19 Mar 49.

173T57

YAGLOM, I. M.

Technology

(Convex figures) Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1951

9. **Monthly List of Russian Accessions**, Library of Congress, July 1952. Unclassified.

1. YAGLOM, I. M.

2. USSR (600)

4. Physics and Mathematics

7. Convex Polyhedra, A. D. Aleksandrov. (Moscow-Leningrad, State Technical Press, 1950). Reviewed by I. M. Yaglom, Sov. Kniga, No. 5, 1951.

9. [redacted] Report U-3081, 16 Jan. 1953, Unclassified.

YAGLOM, I.M.

SHKLYARSKII, D.O.; CHENTSOV, N.N.; YAGLOM, I.M.

[Selected problems and theorems in elementary mathematics. Part 2. Geometry (planimetry)] Izbrannye zadachi i teoremy elementarnoi matematiki. Chast' 2. Geometriia (planimetriia). Moskva, Gos.izd-vo tekhn.-teoreticheskoi lit-ry, 1952. 380 p. (MLRA 6:7)

(Geometry, Plane)

YAGLOM, I. M.

math (2)

Mathematical Reviews
Vol. 14 No. 8
Sept. 1953
Geometry.

8-10-54
LL

Yaglom, I. M. On linear subspaces of symplectic space. Trudy Sem. Vektor. Tenzor. Analizu 9, 309–318 (1952). (Russian) 2

By a symplectic space we mean a real linear space of even dimensions $2n$ in which scalar product of vectors is defined by a non-degenerate skew-symmetric bilinear form $(x, y)=g_{\alpha\beta}x^\alpha y^\beta$ $(\alpha, \beta=1, 2, \cdots, 2n)$, where $g_{\beta\alpha}=-g_{\alpha\beta}$, i.e., $(y, x)=-(x, y)$. In this space the symplectic group [see, e.g., H. Weyl, The classical groups, Princeton, 1939; these Rev. 1, 42] plays the same role as the group of motions in an euclidean space. A linear subspace U of a symplectic space is characterized by two values, i.e., its dimension and its defect (=dimension number of the isotropic subspace contained in it). It is called zero subspace if $p=s$, or symplectic if $s=0$. Then discussion is made for classification and volume of a polyvector in a subspace and for the degree of parallelism as well as orthogonalism of two linear subspaces. There are found many kinds of scalar products of polyvectors in the symplectic space and of angles between two polyvectors. Finally, making use of these results, the system of invariants of two linear subspaces are obtained, e.g., symplectic angles, stationary 2-directions, etc., analogously as in the euclidean space. *A. Kawaguchi* (Sapporo).

YAGLOM, I. M.

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Mathematical Review.
June 1954
Number Theory

10-5-54
LL

Yaglom, A. M., and Yaglom, I. M. An elementary derivation of the formulas of Wallis, Leibnitz and Euler for the number π. Uspehi Matem. Nauk (N.S.) 8, no. 5(57), 181–187 (1953). (Russian)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001961810017-7"

YAGLOM, I.M.

SHKLYARSKIY, D.O.; CHENTSOV, N.N.; YAGLOM, I.M.; RYVKIN, A.Z., redaktor;
GAVRILOV, S.S., tekhnicheskiy redaktor.

[Selected problems and theorems of elementary mathematics. Pt.3.Solid geometry] Izbrannye zadachi i teoremy elementarnoi matematiki. Chast'3. Geometri a (Stereometriia). Moskva, Gos.izd-vo tekhnikc-teoreticheskoi lit-ry, 1954. 267 p. (Biblioteka matematicheskogo kruzhka, no.3.)
(Geometry, Solid) (MIRA 8:4)

YAGLOM, I. M.

6

★Yaglom, A. M., i Yaglom, I. M. Neélementarnye zadači v élementarnom izloženii. [Non-elementary problems in an elementary exposition.] Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow, 1954. 543 pp. 10.15 rubles. 1-F/W

This book is divided into three parts. The first part contains 170 problems. The second part, about four-fifths of the book, contains the details of the solutions. The third part contains the answers, where answers are required, and short hints. This organization allows the student to adjust his use of the book to his ability and independence. The problems vary in difficulty from simple counting problems requiring only ingenuity to problems requiring considerable mathematical maturity for their solution. Difficult problems are indicated with one, two, or three stars, in order of difficulty. For example, the derivation of Stirling's formula for $n!$ is a three-star problem. There are two sections of problems. The first contains combinatorial problems and probability problems. The second (harder) section contains miscellaneous problems, involving relations between points and lines, topology, evaluation of infinite series, number theory, and so on. The book should be a useful source of problems for teachers and students.

J. L. Doob (Urbana, Ill.).

1

was

YAGLOM, Isaak Moiseyevich; TIKHONOVA, E.P., redaktor; SOLODKOV, V.A., redaktor; AKHLAMOV, S.N., tekhnicheskiy redaktor

[Geometric transformations] Geometricheskie preobrazovaniia. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry. Pt.1. [Motions and transformations of similitudes] Dvizheniia i preobrazovaniia podobiia. 1955. 280 p. (Biblioteka matematicheskogo kruzhka, no.7) (MLRA 9:1)
(Geometry, Analytic--Plane)

Yaglom, I. M.

Yaglom, I. M. Geometričeskie preobrazovaniya. I. Dviženiya i preobrazovaniya podobiya. [Geometrical transformations. I. Motions and similarity transformations.] Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow, 1955. 282 pp. 5.45 rubles.

This book, the first of two volumes, deals with motion (Chapter I) and similarities (Chapter II) of the euclidean plane. Each chapter begins with a discussion on what is geometry? The exposition is clear and simple, notable is the avoidance of technical terms, like collineation, in favor of terms more familiar or suggestive to the student; for example, "composition" (of transformations) is used instead of "product".

Half of the book consists of the text and the formulation of 166 problems, the second half gives solutions of the problems. These are partly novel and partly well-known theorems (e.g. the properties of the Euler line of a triangle) in problem form.

H. Busemann.

Yaglom, I.M,

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Hun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.
There are 2 references, both of them USSR.

Shirshov, A. I. (Moscow). One Some Non-associative Nil-rings in Algebraic Algebras. 40

There are 3 references, 1 of which is USSR, and 2 are English.

Yaglom, I. M. (Moscow). On Some Algebraic Characteristics of Real Simplectic Spaces. 40-41

Section of Differential and Integral Equations 42-73

Reports of the following personalities are included:

Aleksandryan, R. A.(Yerevan). Qualitative Properties of Solutions of Some Mixed Problem and Spectral Eigenfunctional Expansion . 42

Arzhanykh, I. S. (Tashkent). Field Method of the Theory of Mathematical Physics Differential Equation Hyperbolic System. 42

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YAGLOM, I.M.

Two new books about Lobachevski'snon-Euclidean geometry ("Elementary introduction to Lobachevski's geometry." A.P. Norden. "Summary of the noncontradictoriness proof in Lobachevski's planimetry." B.N.Delone. Reviewed by I.M. IAglom. Usp.mat.nauk. 10 no.1:233-236 '55 (MLRA 8:6)
(Geometry, Non-Euclidean) (Norden, A.P.)(Delone, Boris Nikolaevich, 1890-)

YAGLOM, I.M.

VILENKIN, N.Ya.; YAGLOM, I.M.

"Arithmetic of natural numbers." [professor] I.K.Andronov. Reviewed by N.Ia.Vilenkin, I.M. Iaglom. Usp.mat.nauk. 10 no.2:225-228 '55. (MIRA 8:8)
(Arithmetic) (Andronov, Ivan Koz'mich, 1894-)

YAGLOM, I.M

SUBJECT USSR/MATHEMATICS/Geometry CARD 1/1 PG - 704
AUTHOR GOLOVINA L.I., JAGLOM I.M.
TITLE The induction in the geometry. (Popular Lectures on Mathematics No. 21).
PERIODICAL Moscow: State publication for technical-theoretical literature 100 p. (1956)
reviewed 4/1957

This book has been written for the higher classes of schools and for educational high-schools. It joins the book of Sominskij "The methods of mathematical induction". In the present book at first the method of the complete induction is introduced and then the application of the method in several domains of the elementary geometry is represented (geometric locus, definitions, Euler's theorem, the problems of map colouring, induction with respect to the number of dimensions and other problems). 40 examples are elaborated completely and 37 problems are given with instructions. The contents of the present book had been the contents of two lectures of I.M.Jaglom which had been held for the members of the Mathematical Circle which exists beside of the Moscow University.

YAGLOM, I. M.

Math

Yaglom, I. M. Geometričeskie preobrazovaniya. II. Lineinye i krugovye preobrazovaniya. [Geometrical transformations. II. Linear and circular transformations.] Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow, 1956. 612 pp. 10.45 rubles.

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This second volume, like the first one, is intended for superior high school students and high school teachers, and the material is strictly adapted to the background of Russian high schools. The methods are purely synthetic [illegible] familiarity with the geometry of the circle is assumed, but other conic sections are not considered. The first part deals with affine and projective transformations of E^2 and E^3. Projective spaces are never introduced axiomatically, the euclidean space is completed by elements at infinity. The second part deals with the elementary aspects of Laguerre geometry, in particular, reflections and inversions in circles are studied in detail. Hyperbolic geometry is treated twice, first its Klein model in part 1, and then its Poincaré model in part 2. There are about 200 problems, some of them very interesting, formulated in the text proper (pp. 1–354) and their solutions, often with digressions into related subjects, occupy the remaining space (pp. 355–605).

H. Busemann (Los Angeles, Calif.).

1-FW

SANTALO, L.A.; SHESTOPAL, M.G. [translator]; LOPSHITS, A.M., redaktor; YAGLOM, I.M., redaktor; AGRANOVICH, M.S., redaktor; GRIBOVA, M.P., tekhnicheskiy redaktor

[Introduction to integral geometry. Translated from the English] Vvedenie v integral'nuiu geometriiu. Perevod s angliiskogo M.G. Shestopal. Pod red. A.M.Lopshitsa i I.M.IAgloma. S dop. I.M. IAgloma. Moskva, Izd-vo inostrannoi lit-ry, 1956. 183 p. (MLRA 10:1)

(Geometry, Differential)

YAGLOM, Isaak Moiseyevich

[redacted]

[Geometric transformations] Geometricheskie preobrazovaniia. Moskva, Gos.izd-vo tekhniko-teoret.lit-ry. 1956. Pt.2. [Linear and curvilinear transfrmations] Lineinye i krugovye preobrazovaniia. 611 p. (Biblioteka matematicheskogo kruzhka no.8) (MIRA 10:10)

(Transformations (Mathematics))

VILENKIN, N.Ya.; YAGLOM, I.M. (Moskva)

Teaching mathematics in teachers' institutes. Mat. v shkole no.2:45-47 Mr-Ap '56. (MLRA 9:6)
(Mathematics--Study and teaching)

YAGLOM, L. M.

1-FW

3

Yaglom, I. M. Curves in symplectic space. Trudy Sem. Vektor. Tenzor. Anal. 10 (1956), 119–137. (Russian)

Frenet formulas for curves in projective symplectic space were obtained by Chern and Wang [Sci. Rep. Nat. Tsing Hua Univ. 4 (1947), 453–477; MR 10, 65]. The author constructs a similar theory of curves in affine symplectic spaces. Curvatures and torsions are defined for a "general" point of a "general" curve (all the contact elements span the space) in terms of a natural parameter, the symplectic arc length. These functions determine the curve. (The curvatures, however, are not independent.) The differential equations are integrated explicitly for a special case of constant curvatures and torsions.

L. W. Green (Minneapolis, Minn.).

YAGLOM, I.M.

"Non-Euclidean geometries" by B.A.Rozenfel'd. Reviewed by I.M. IAglom. Usp.mat. nauk 11 no.6:253-257 N-D '56. (MIRA 10:3)

(Geometry, non-Euclidian)

(Rozenfel'd, B.A.)

YAGLOM, I. M.

PHASE I BOOK EXPLOITATION 16

Yaglom, A. M., and Yaglom, I. M.

Veroyatnost' i informatsiya (Probability and Information) Moscow, GITTL, 1957. 159 p. 30,000 copies printed.

Ed.: Goryachaya, M. M.; Tech. Ed.: Gavrilov, S. S.; Reviser: Moiseyeva, Z. V.

PURPOSE: The book is designed for people without higher mathematical education. The authors' main task was to acquaint the general reader with certain not-too-complicated, but very important mathematical concepts and their application in modern engineering.

COVERAGE: The fundamentals of the classic theory of probability and the general concept of probability in connection with Boolian algebra are presented. The concepts of entropy and information are introduced and their mathematical formulation given. The importance of the concepts of entropy and information is illustrated by certain logical problems. The concepts of a code and of its economy are introduced.

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The binary code is described and its economy studied. The binary code is extended into the code of m signals. Special attention is paid to the Shannon-Fano Code and to Shannon's work in information theory. The fundamentals of the Shannon-Fano Code and its efficiency are demonstrated. The transmission of a message, when communication line disturbances are present is discussed. The concepts of the speed of transmission and the carrying capacity of communication lines are introduced and formulas given. No proofs are given for the formulas and only one individual case given by A. N. Kolmogorov is studied. There are 8 references mentioned in the introduction and in footnotes, 7 of which are Soviet and 1 English. In the introduction the authors thank Academician A. N. Kolmogorov for his valuable advice. They also thank editor M. M. Goryachaya for her remarks concerning the arrangement of the book material.

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Probability and Information

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LK/bmd
27 June 1958

YAGLOM, I.M. (Moscow)

New books on the theory of geometric constructions. Mat. pros. no.1: 251-254 '57. (MIRA 11:7)

(Geometry)